REMARKS

This is in response to the Office Action dated April 28, 2004. In view of the foregoing amendments and following representations, reconsideration is respectfully requested.

On page 2 of the Office Action, claims 23 and 24 are objected to based on a minor informality. Accordingly, claims 23 and 24 are amended to insert the term "said" after "wherein" as suggested by the Examiner.

Next, on pages 2-3 of the Office Action, claims 11, 17 and 23-28 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9-12 and 14-17 of copending Application no. 10/009,690 in view of Foye (U.S. Patent No. 3,556,197). As previously indicated, a Terminal Disclaimer will be submitted upon an indication of allowable subject matter to overcome the provisional obviousness-type double patenting rejection.

Next, on pages 4-9 of the Office Action, claims 11-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kittilsen (U.S. Patent No. 5,915,455) in view of Foye (U.S. Patent No. 3,556,197). Also, claims 11-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naess, Jr. et al. (EP 0 337 769) in view of Foye. These rejections are respectfully traversed for the following reasons.

Kittilsen et al. discloses a horizontal casting apparatus provided with a mold including a primary water-cooling circuit 11 and a secondary water-cooling circuit 12. In the primary water-cooling circuit 11, water passes through the mold without directly

contacting the magnesium. The water from the secondary water-cooling circuit 12 is sprayed through slots or nozzles 18 directly onto the magnesium hitting the metal at an angle of about 30-35°.

The mold also has an oil ring 19 formed of metal with channels 20 for supplying oil to lubricate the mold. Reference numeral 21 denotes a transition ring of insulating porous refractory material at the inlet of the mold through which a protective gas is supplied from channels or gas supply passages 22. The molten metal will solidify at the point denoted by reference numeral 25. The protective gas is supplied to the molten metal prior to solidification in order to prevent discoloration. Thus, the gas does not provide any lubricating effect in the mold. The oil is supplied at the solidification point 25 to lubricate the mold.

In the magnesium casting art, one of ordinary skill in the art would have recognized that a protective gas has to be used because magnesium is highly reactive with air. Further, a person of ordinary skill in the art of horizontal casting would not be motivated to add any protective gas when casting other metals, such as iron or aluminum. These metals do not cause problems due to contact with air. Thus, the supply of a protective gas to such equipment would be unnecessary and would complicate the construction of the mold. Therefore, it is submitted that the proposed combination of Kittilsen and Foye would not result in the use of a combination of oil and gas as a lubricant.

Foye describes an apparatus for horizontal casting where oil is supplied as a lubricant through a capillary gap 37. However, Foye does not disclose or suggest any

supply of gas. It should furthermore be noted that the oil supplied in the Foye apparatus is led through conduits 32 into depressions 31 in the mold section 30. The depressions 31 are covered by a gasket 35 with slots 36 corresponding to each depression 31. The oil will flow from the depressions through the slots into the gap 37.

Accordingly, Foye discloses a mold with a plurality of depressions in the mold housing into which oil is supplied. The oil is thereafter led, through slits in the gasket, into the mold cavity. The apparatus according to Kittilsen is provided with one oil ring 19 for supplying oil to lubricate the mold. It is not clear how the these solutions will lead to the use of a plurality of restricting elements forming a plurality of sectors through which oil and gas can be led separately as required in claims 11 and 17 of the present application.

Even though the object, according to Foye, is to differentiate the supply of oil around the circumference of the mold and thereby provide more oil to the bottom of the mold, Foye will not be successful with such differentiation, since there are no physical restrictions between the slots 36 in the gap 37 which could prevent the oil from being pressed sideways along the circumference of the gap 37.

The present invention does not have such a gap, but instead employs permeable wall material through which both oil and gas is supplied to the mold cavity. Furthermore there are restrictions between the permeable wall material and the mold wall to form a plurality of physically divided sectors, thereby avoiding sideways distribution of the oil and gas. Thus, the present invention presents an improved solution for the controlled supply of both oil and gas through physically divided sectors in a mold for horizontal casting.

Naess discloses a casting apparatus for vertical casting including a supply of both oil and gas. The horizontal support 5 is provided at the outlet of the mold cavity. Metal is poured down into the mold inlet 1 and will solidify in the mold on the support 5. The support 5 is thereafter lowered to allow more molten metal to enter the mold. However, Naess does not provide a solution to the problem of providing a differentiated supply of oil and gas to the mold.

A person of ordinary skill in the art of vertical casting knows that the gas will become entrapped in the metal if used in a conventional horizontal casting apparatus, and would therefore clearly would not have been motivated to modify the Naess apparatus in view of the teachings of Foye.

In view of the above, it is submitted that the present application is now clearly in condition for allowance. The Examiner therefore is requested to pass this case to issue.

In the event that the Examiner has any comments or suggestions of a nature necessary to place this case in condition for allowance, then the Examiner is requested to contact Applicant's undersigned attorney by telephone to promptly resolve any remaining matters.

Respectfully submitted,

Inge JOHANSEN et al.

By: _____

Michael S. Huppert
Registration No. 40,268
Attorney for Applicants

MSH/kjf
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
August 6, 2004